

Chapter 2

History of the

Upper Gila River Watershed



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This Participatory Assessment seeks to illustrate the state of current conditions in the Upper Gila River Watershed from the perspectives of regional stakeholders. This method also serves as a way of establishing a baseline for planning alternate scenarios for the area's future. A review of the local history with an eye toward trends and changes in the landscape can help inform how current conditions arose and what factors might be important in preparing credible scenarios for the future. Humans have certainly had a notable impact on the shape of the regional landscape going back thousands of years, and patterns of settlement and land use over the last 150 years have led to additional changes in the watershed. The locally unique aspects of geology, geography, and weather patterns have also contributed to an inconstant landscape. A brief exploration of the interaction of several of these elements over time offers insight into the unpredictability and resilience that are hallmarks of the Upper Gila.

Access to reliable and reasonably clean supplies of water has been crucial to sustained human presence in the Upper Gila River Watershed for millennia. Particularly because of the arid climate and the long dry periods between the annual cycle of summer and winter rainfall, water has been a limiting factor on settlement patterns. Modern technology has expanded the availability of water, with improved abilities to drill for water and transport it. As a result, certain areas have been settled and even irrigated when their former uses were more seasonal or transient in nature. Even so, the substantial cost of modern efforts to procure clean and reliable water supplies continues to influence land uses, underscoring the high value of water resources.

The Upper Gila River Watershed has a well-documented and lengthy record of human influence on the landscape. Archaeological studies reveal several periods of extensive settlement. Agriculture has deep roots in the area, and far-reaching canal systems demonstrate a history of carefully-organized irrigated farming. The perennial flows of the Gila River itself, combined with fertile soils in the floodplain, made this region especially suitable for raising crops during the long growing season. Specially-adapted cultivation

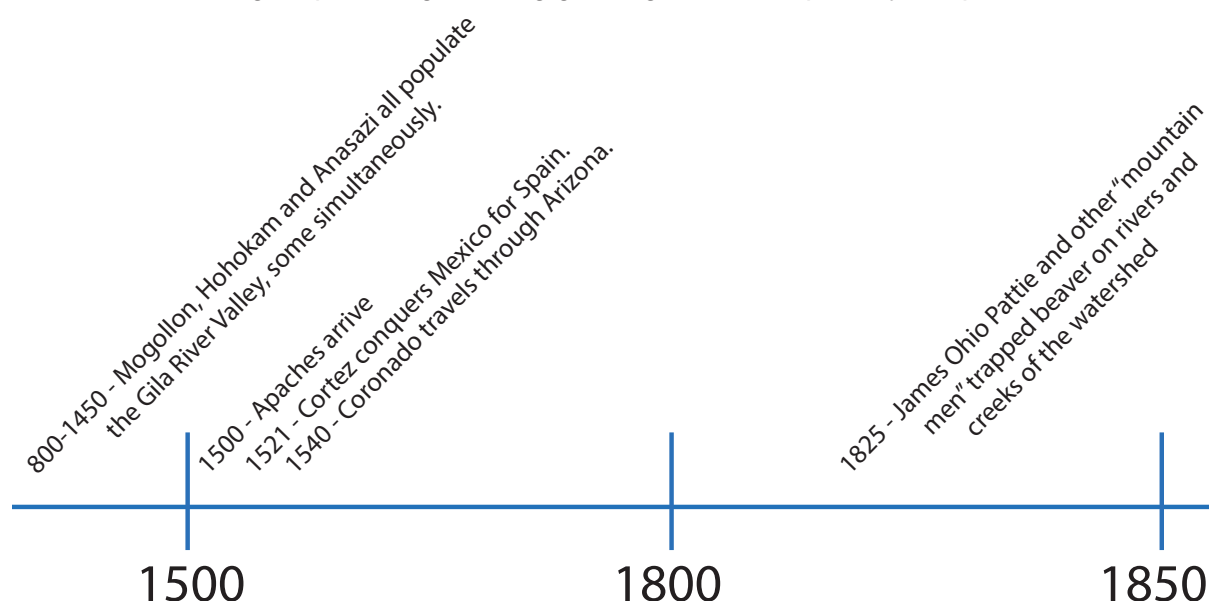


Figure 2-1 Timeline of the Upper Gila River Watershed 800 AD to the Present

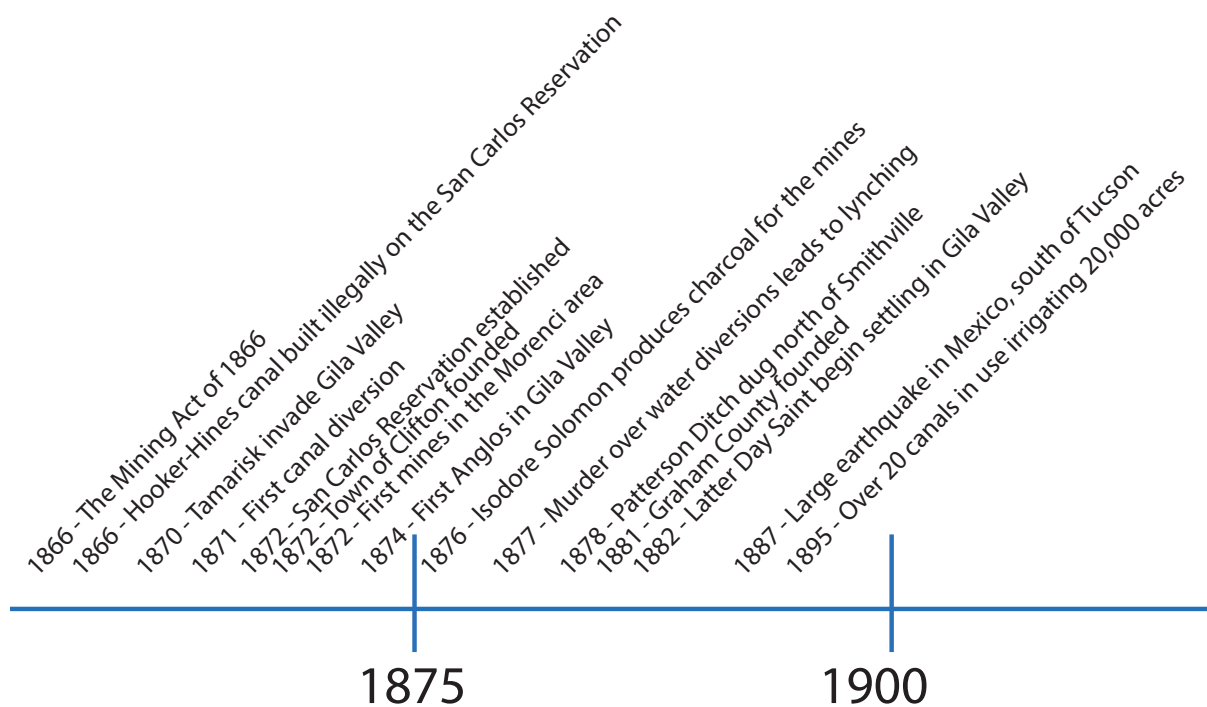
Created by Gila Watershed Partnership Members in April, 2013. For an interactive version of this timeline with photos and videos visit <http://wrrc.arizona.edu/Upper-Gila-Timeline>

practices, as well as the use of native species, allowed desert dwellers to flourish, despite the harsh summer conditions and inter-annual weather variability that are hallmarks of the basin and sky island range region (Tucker & Ezzo, 2006).

Early inhabitants of the watershed were well aware of how elevation, soil type, and rainfall interacted to create different ecosystems in different parts of the watershed. Hanging canals carved into the Mount Graham mountain range collected rainfall that fell in greater amounts at higher elevations and channeled this precious water down to fields at lower levels. Seasonal movements were timed to make use of this variability in order to increase the gathering of food and fiber, such as mesquite beans, saguaro ribs and fruit, nopalitos, and cholla buds from the valley floor, as well as the collection of manzanita fruit and the hunting of animals along the upper slopes of the Pinaleños and other mountain ranges in the area (Lascaux, 2006; Neely & Murphy, 2008).

Remains of pottery, tools, and other artifacts in the watershed indicate not only the long-term presence of human habitation, but also the role of the Upper Gila Valley as a major trade route between regional cultures throughout the Southwest. The topography of parts of the Valley reveals a deeply incised channel within a narrow canyon, rendering travel difficult, but access to a reliable source of water in such a desert region made the route critical for flows of information and trade as well as water. The watershed has thus served as a homeland and weigh station imbedded a regional network of societies for centuries (Hastings & Turner, 1965, pp. 22–46).

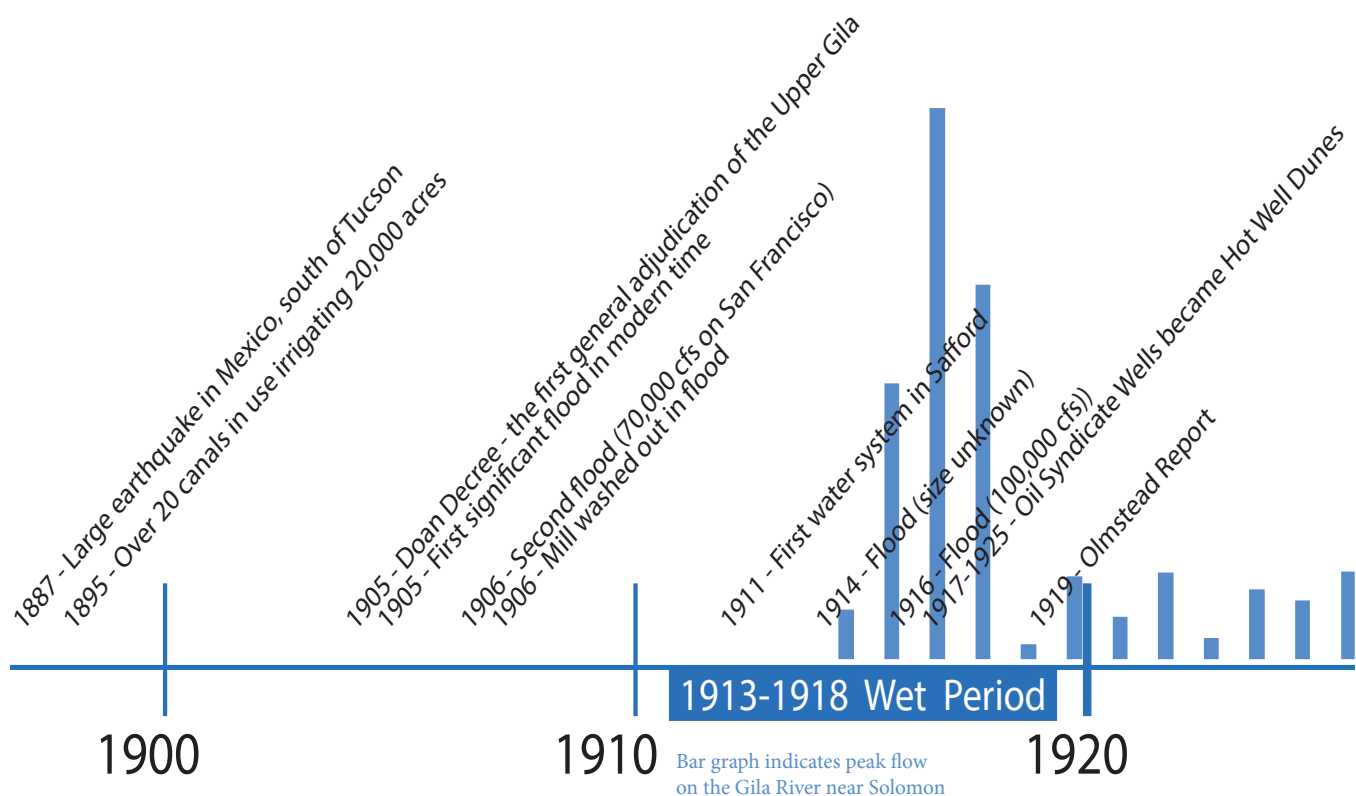
The diaries and other writings of early Hispanic and Anglo visitors to the region confirmed that many of these cultural practices, seasonal harvest migrations, and trade routes continued into recent times. Attempts to maintain ancient traditions among the Apache led many to try to leave the restrictive confines of the San Carlos reservation in the late 1900s. This unfortunately resulted in additional cross-cultural conflict between the Apache, local



Anglo settlers, and the United States Army. Federal policy for decades encouraged less migratory and more sedentary livelihoods for indigenous peoples, which led to increased importance in surface water rights for agriculture and residential use. Water rights for the San Carlos Apache and other Native American cultures along the Gila River have remained a fundamental part of over-all water use in the Valley. The construction of Coolidge Dam and the San Carlos Reservoir in the 1920's was intended by the U.S. Bureau of Indian Affairs to create a more reliable source of water to promote permanent settlement and farming for the Pima and Maricopa communities downstream, whose centuries-old irrigated agricultural practices had suffered from the 1890s onward due to greater diversions upstream (Sheridan, 1995, pp. 207–208). Adjudication of water rights has continued to the present day to play a critical role in shaping the economy of the region.

The first records from travelers of European descent into the region reach back to a multi-year quest by Francisco Vázquez de Coronado y Lujánte for the legendary Cibola and the cities of gold. Coronado's large expedition set out from Mexico in 1540, with substantial numbers of horses, cattle, and other livestock to assist in the journey. Their travel generally followed river courses, for access to water for the humans and the livestock was essential as they traveled through the desert landscape. The expedition arrived at the Gila River after following either the Santa Cruz or San Pedro rivers northward. There the party turned eastward and entered the Upper Gila Valley. Their presence was short and did not result in the typical Spanish settlement patterns of missions and presidios in the area. Nonetheless, their journey mirrored the routes of generations of previous travelers seeking their way through the landscape (Faulk, 1970, pp. 3–13).

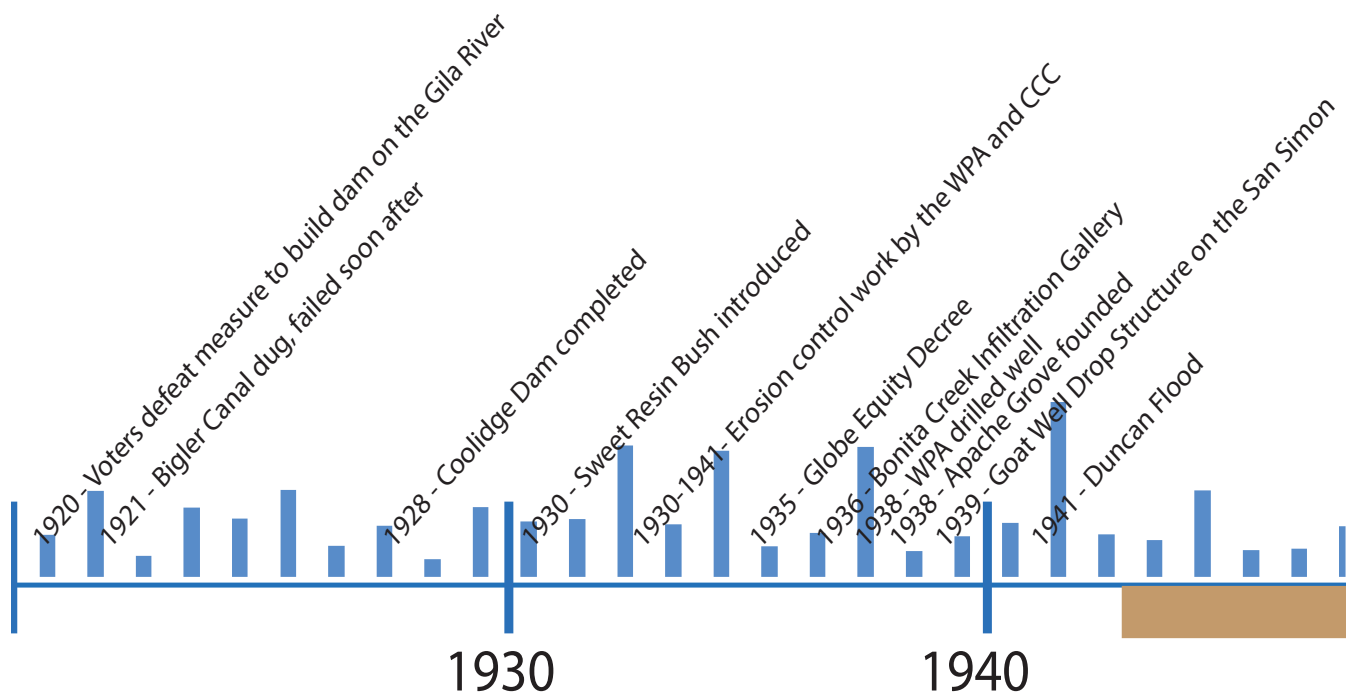
Their trek also played a part in the introduction of new actors on the landscape. Many livestock separated from the expedition and became the core of a remnant feral population of cattle, horses, and donkeys. These new residents of the watershed began to exert a



novel influence on the region through their migration and grazing patterns. The lack of more lasting Spanish settlements likely precluded widespread introduction of other plant and animal species from Europe and beyond into the Valley during this period of history, such as those found further south in what have been referred to as the gardens of New Spain. Even so, because of the region's role as a corridor of travel and trade, introductions of non-native species of flora and fauna have been a regular occurrence. These exotic arrivals sometimes initiated outsized impacts on the existing ecosystems of the watershed (Dunmire, n.d.; Tellman, Finch, Edminster, & Hamre, 1996, pp. 137–157; Webb, Leake, & Turner, 2007, pp. 31–39).

The first presence of Anglo-Americans can be traced to 1826, when a group of trappers ventured into the Valley. James Ohio Pattie chronicled these escapades for readers in the eastern United States, offering enthralling tales of adventures in a far-off land that, at the time, was still part of a newly-independent Mexico. Pattie's group sought to capture animal hides, and particularly beaver pelts, to sell for use in fashionable clothing in the eastern U.S. and Europe. His account thus gives an indication of the types and distribution of wildlife in the region, from javelina and grizzly bears to mountain lions and deer. Pattie may have offered inflated numbers in terms of the total count of pelts his group collected, but his story suggested that there had been healthy populations of beavers, although a rapid reduction in numbers was occurring due to widespread trapping. He noted a lack of beavers on the San Carlos and other tributaries, for instance, which pointed to trapping activities by others in the area and illustrated that there were already noticeable impacts from over-hunting. Though many elements of his stories have been called into question by historians, his book still offers a rare written account of conditions in the Upper Gila before waves of new settlers arrived (Pattie, 1988).

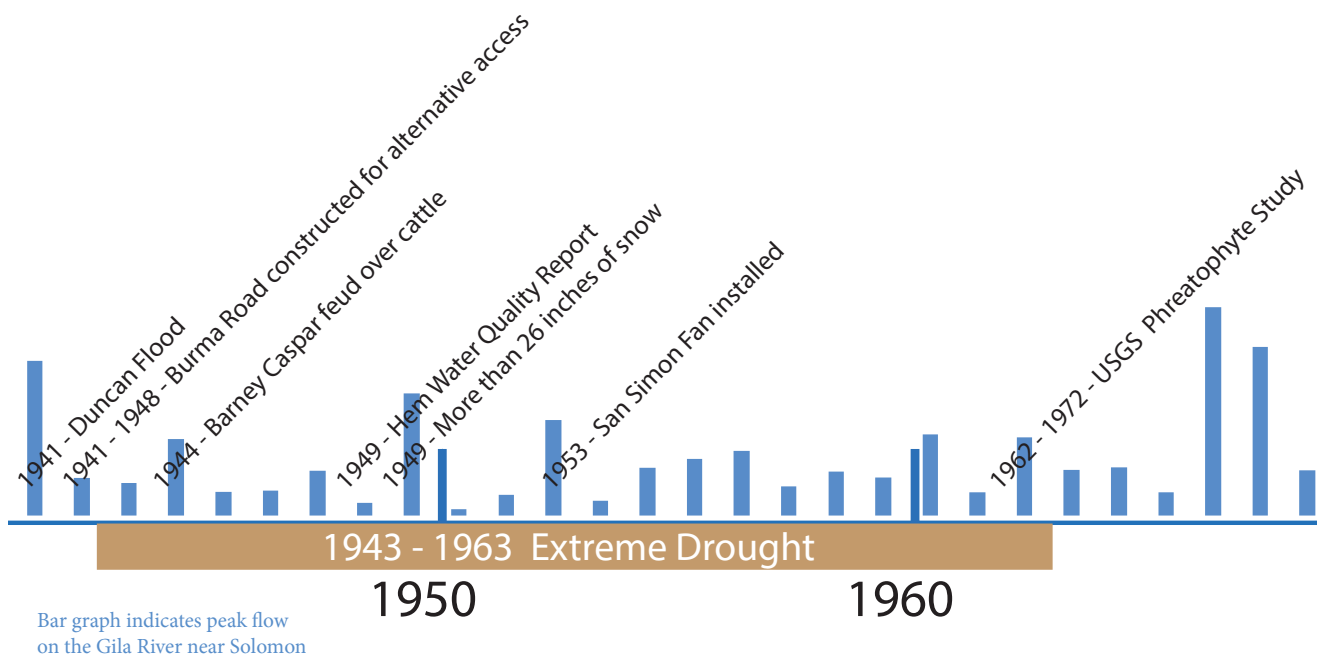
Other travelers also trekked through the Gila Valley on their way westward, including trapper-traders like Kit Carson, military scouts, and miners. The rough terrain proved



challenging for pack animals and nearly impassable for wagons and other wheeled transport. The Kearny military expedition to California marched through the area during the 1846 war with Mexico. One narrow, meandering section of the Gila Valley northwest of the present-day town of Duncan was so challenging to traverse that it earned the moniker of the Devil's Turnpike. These arduous trail conditions encouraged a search for alternate routes westward. By the time of the large-scale westward immigration boom to California, new traces to the south and north had become more popular for use as wagon trails. Until the opening of these other routes, however, the Upper Gila continued to serve as a pathway for explorers, and the region thus figured prominently in accounts of present-day Arizona in the first half of the nineteenth century (Ames & Griffin, 1942; Bieber, 1937; Carson, 1935; Clarke & Perry, 1988; Emory, Abert, Cooke, & Johnston, 1848; Etter, 1998; Turner, 1966).

The river also served as an important political corridor for a time. An extensive length of the Gila marked the border between the United States and Mexico from the signing of the peace treaty ending hostilities in 1846 until the agreement that concluded the Gadsden Purchase in 1854. This shift in the political landscape had implications for the growth of the Gila River Valley. The treaty was spurred on in large part by the push to create a snow-free southern route for a transcontinental railroad, although the completion of the Southern Pacific was still a couple of decades in the making. The opening of alternate transportation corridors by wagon and by rail diverted the future flow of trade and traffic away from the Upper Gila Valley toward towns like Tucson (Griswold del Castillo, 1990; Sheridan, 1995).

Although the region may have lost some development opportunities due to the redirection of regional and national trailways, other events spurred on the influx of new arrivals. In the 1860s, news spread of valuable mineral wealth in parts of the Valley. Prospectors soon followed, and numerous mining operations began in earnest. Much of the early activity was centered near Clifton and Morenci (Patton, 1977; Ramenofsky, 1984; Solomon, 1994). While some gold and silver deposits were uncovered, mining efforts focused on copper as the primary targeted ore for extraction. These large copper deposits led to the construction of a smelter and the first railroad line in Arizona. From early placer mining to more industrially-oriented extraction processes, access to water proved crucial. The communities that developed around mining towns also required water for daily living. Springs and small

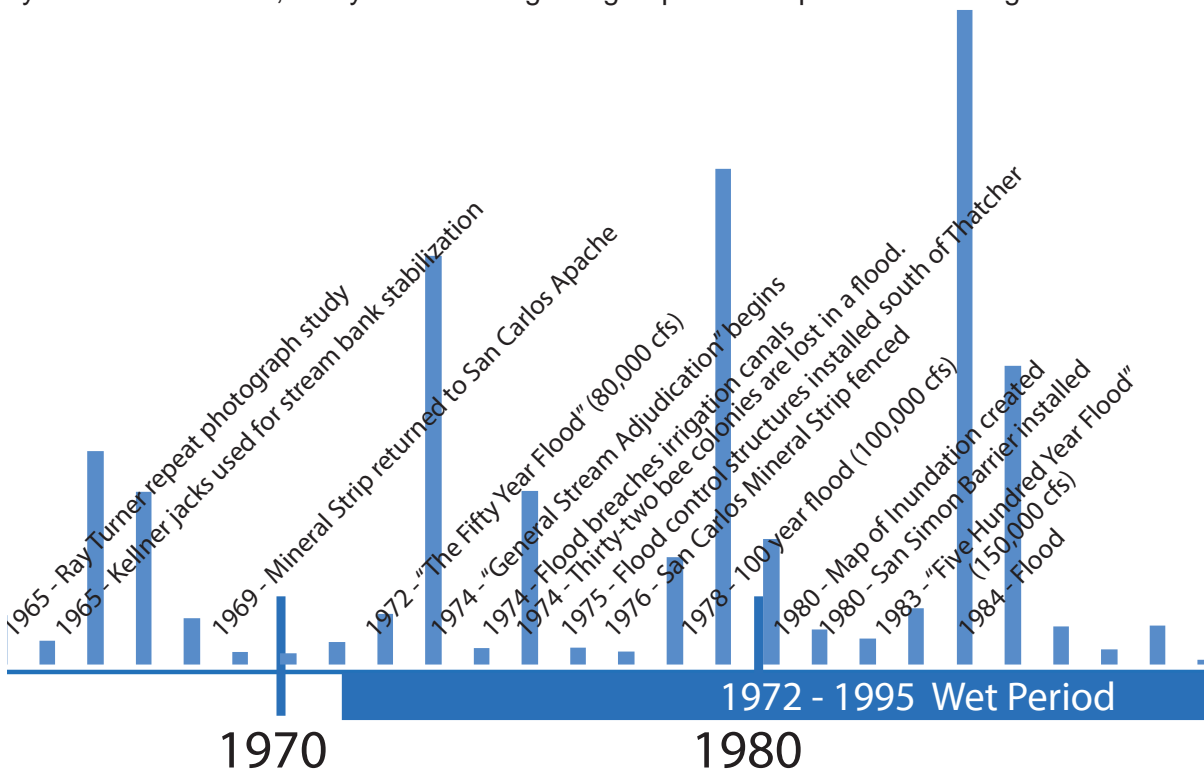


tributaries were often dammed and piped to meet these varied needs, and the scale of these waterworks grew commensurate with the growing mining and municipal demands (Faulk, 1970, pp. 216–223; Sheridan, 1995, pp. 147–161).

Excitement over new mining sites sometimes led to widespread rumors and the creation of sham corporations. One of the more infamous cases involved the stories of fantastic finds of gold and copper ore associated with the Spnazuma Mining and Milling Company in the northeast foothills of the Santa Teresa mountains. Through the work of an investigative journalist, the sordid details of this grandiose scheme to swindle investors were made public. The company soon went bankrupt, and the townsite was abandoned. Although there were a few notable cases of chicanery and fraud, mining became a major economic pillar in the Valley and has continued to play an important role up to the present-day (Faulk, 1970, pp. 150-151).

Not long after the initial mining boom, waves of settlers arrived looking for arable farmland. Instead of seeking quick riches from mining, these groups sought to build homesteads and plant roots in the region. Early settlements took advantage of water supplies from the Gila River to build irrigation networks – often on top of the remains of the ancient Native American canal systems. Immigrants of many backgrounds soon reached the Valley. Anglo settlers came from the eastern United States. Sizeable numbers of others were immigrants born abroad, including many from Central and Eastern Europe. Many settlers hailed from Mexico. Historical accounts record the prevalence of different languages in various communities, although Spanish and English were used most frequently (Duncan Arizona Centennial Committee, 1983,1984; Eastern Arizona Museum and Historical Society, 1979; Ramenofsky, 1984; Sheridan, 1995; Stout, 1975).

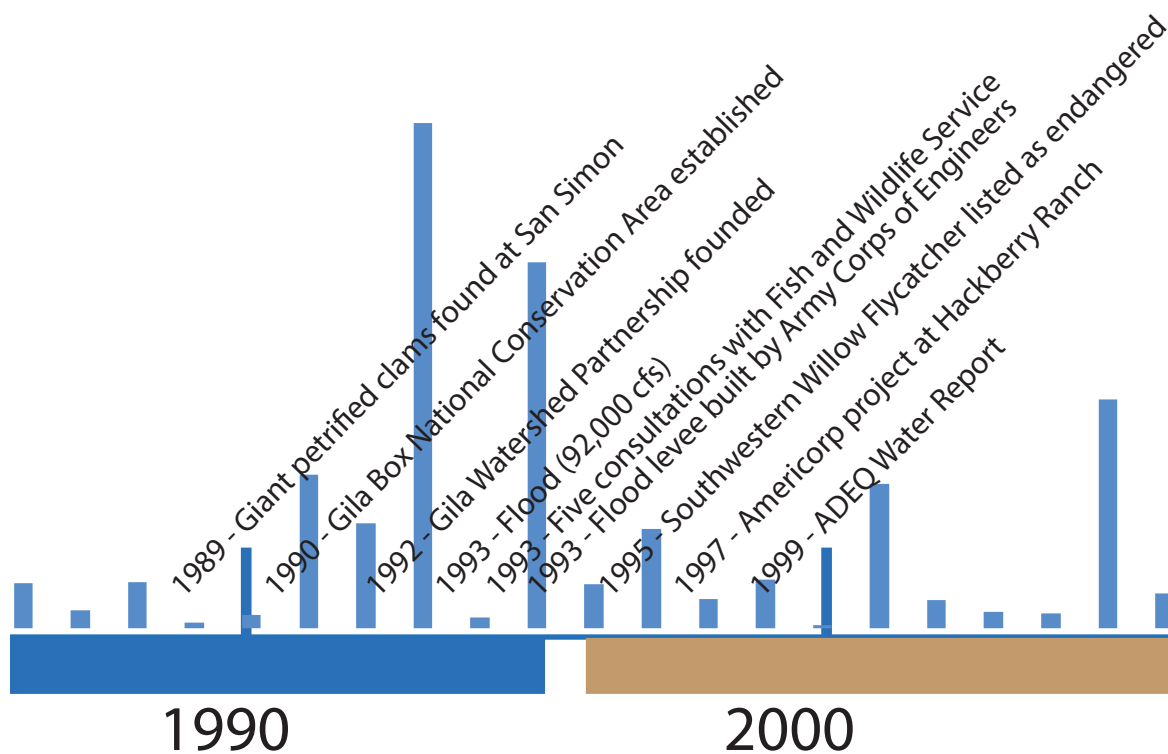
New arrivals brought their cultural traditions and practices with them, including their belief systems. As a result, many different religious groups were represented throughout the



Valley. A Jewish community sprang up early on in this period of growth, with prominent families such as the Solomons of Solomon(ville) among them. Catholic churches soon appeared, as did houses of worship for several different Protestant denominations. From Utah or other points north, Mormons came in large numbers, many as part of a larger plan of settlement throughout the West with the aim of creating a State of Deseret. Religious associations proved important in re-purposing the bottomlands for agriculture. Flood irrigation was required to make the desert bloom during the hot and harsh summer months, and community-oriented irrigation districts were organized to build the canal systems and oversee the heavy demands of maintenance to keep these systems operational (Calvin, 1946, pp. 79–92; “Gila Valley Irrigation District: Safford, Arizona,” 1928; Ramenofsky, 1984).

Changes in technology have resulted in modifications to farming and land use patterns throughout the course of the Gila’s history of human occupation. From a market-driven perspective, the arrival of the railroad – and later, paved surface roads – led to the integration of the local farm economy into national and international markets. Instead of selling crops to the nearby mining towns or local military installations, new sellers were suddenly available. Choice of crops by local farmers then became influenced by opportunities to participate in distant commodity markets. Cotton became popular among farmers in the Valley, and it remains a staple crop today. Cultivation practices also changed to meet the often water-intensive needs of new crops and make use of the newly available machinery for large scale agriculture (Duncan Centennial Committee, 1984).

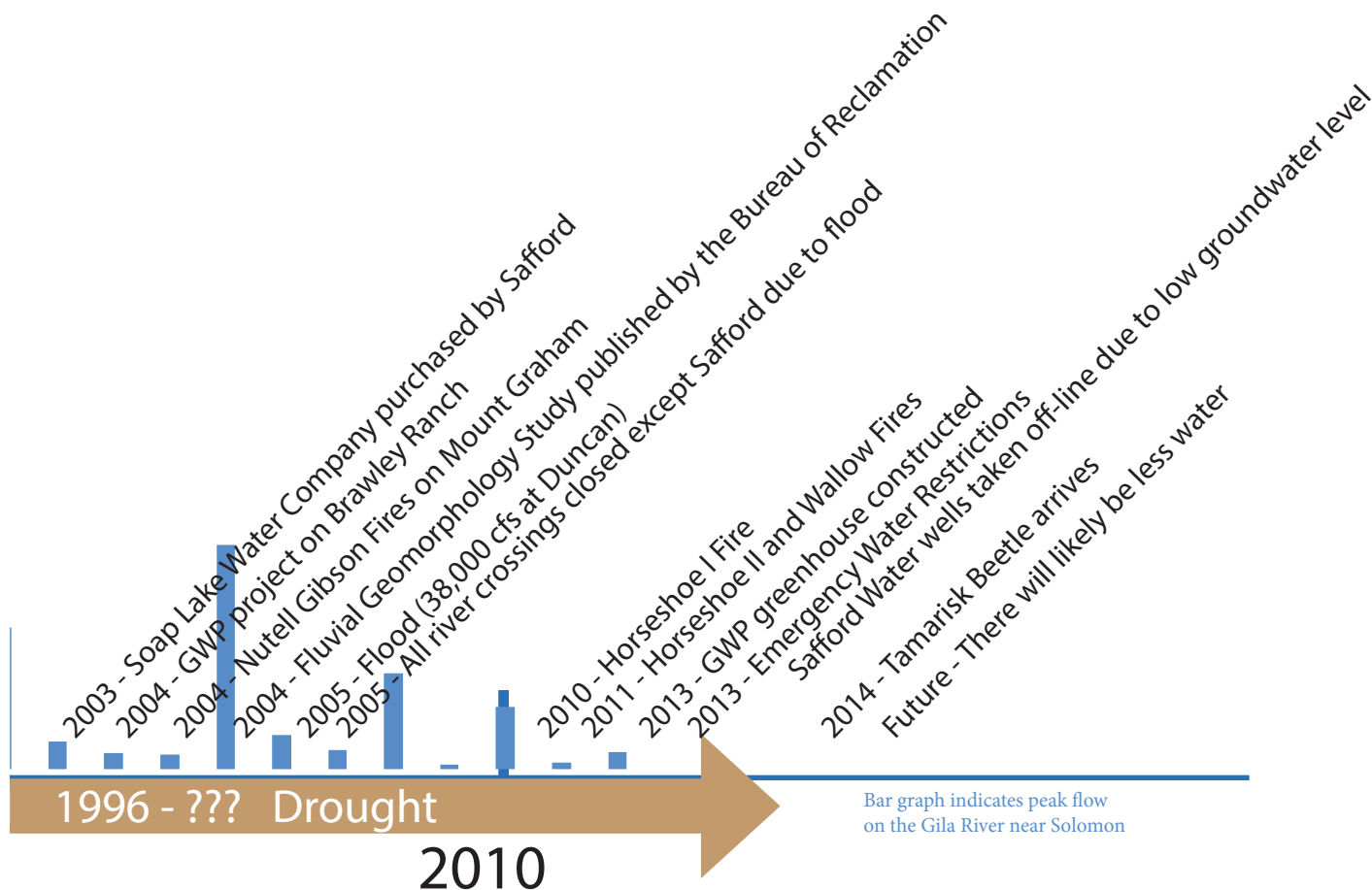
New plant species were introduced into the landscape during these waves of settlement. New crops were planted in the tilled fields, and ornamentals were carefully tended around homesteads. Some plants were reminders of distant childhood homes, while others provided shade in the intense desert sun. Some transplanted species found a suitable habitat in their new locale, and they soon began spreading rapidly into niches throughout the Valley. Certain plants found their way into the riparian areas along the Gila and its tributaries. Often these newcomers had vigorous growth habits and no natural predators,



allowing them to multiply quickly. Major ecological disturbances – whether their causes were settlement activities, like farming and ranching, or were of non-human origin, like droughts or major flood events – would provide opportunities for these new species to crowd out native ones. Some sections of riparian areas along the Gila have been overtaken by these exotic arrivals, such as salt cedar, to the detriment of the earlier cottonwood-willow galleries. The impacts of these shifts on plant and animal communities are currently under intense study by scientists.

The ability to drill deep wells into an aquifer containing agriculturally-suitable water quality has expanded agriculture into some areas far from the Gila and its tributaries. The State of Arizona makes a legal distinction between surface flows and groundwater, which has helped the expansion of agriculture in some areas where surface waters are already completely or even over-appropriated. It also allows for differentiation of water sources for non-agricultural uses. For instance, the municipally-operated water utility in Safford collects groundwater from an infiltration gallery buried in the Bonita Creek subwatershed to provide the majority of the annual demand for drinking water. This designation as groundwater distinguishes the source as legally separate from the already appropriated surface flows along Bonita Creek.

Another long-standing economic driver throughout the watershed is ranching. Feral herds have grazed throughout the region since the appearance of Coronado, but commercial ranching began in earnest in the 1870s and 1880s. Much of the Valley was too far from surface flows to be irrigated economically. Desert-adapted vegetation, however, could subsist on the low and often erratic precipitation. These areas were used by the Apache, as well as later Latino and Anglo settlers, for livestock grazing. Even before the arrival



of the railroad, sizeable herds were driven in from Texas and other distant places to take advantage of areas of luxuriant native grasses. The San Simon bottomlands were considered by early travelers and settlers to be an especially prime area for grazing.

Unfortunately, a combination of heavy over-grazing, the channelization of streambeds by early settlers, and a multi-year drought in the late 1880s and into the 1890s devastated both the herds of cattle and the fragile desert ecosystems. The introduction of non-native grasses during such times of stress and disturbance also made conditions difficult for the return of the native grasses. Loss of vegetative cover over the ensuing decades exposed the bare soils to intense summer monsoon rains and led to heavy erosion and arroyo downcutting in many areas. This contributed to the lowering of the water table and further degradation of vegetation. Enormous efforts have been invested in attempts to slow or stop the erosion process and the restoration of native vegetation cover from the 1930s to the present. Changes in rangeland management on both private and federal lands have been implemented to counteract the negative consequences of earlier grazing practices. The construction of thousands of sediment control structures of a multitude of sizes has prevented the loss of a great deal of additional soil into the Gila River and the San Carlos Reservoir, where soil accumulation decreases the reservoir's total storage capacity. Efforts at vegetation restoration have often been met with at best mixed results (Webb et al., 2007, pp. 185–186).

All these different groups of newcomers were arriving in an already long-settled land. Much of the watershed in the early nineteenth century fell under the influence of the Apache, who were organized into several different bands. In addition to cultivating crops in the floodplain of the Gila and several of its tributaries, they engaged in seasonal harvesting and hunting practices of native plants and animals that involved wide patterns of migration during the course of the typical year. These habits, which might be considered common pool resource management in contemporary terminology, were at odds with prevailing Anglo settler notions of ownership and delineated property rights. Struggles for control and dominance ensued over the coming decades. The Upper Gila River Watershed became nationally known because of these ongoing conflicts and the appearance of charismatic leaders like Geronimo. The federal government in the post-Civil War era began to employ the U.S. Army to quell such conflicts, and the Apache were largely relegated to reservations and government-based support programs by the end of the 1880s. Reservation boundaries and associated rights would contract and expand over the decades, such as with the changing of hands of the San Carlos Mineral Strip, the construction of Coolidge Dam, and the return of the control of grazing rights on parts of the reservation to the Apache in the 1930's. Negotiations continue into the current day, particularly with respect to the seniority of water rights under Arizona's prior appropriation system. Allocation of water rights, along with related efforts at monitoring and enforcement of the exercise of those rights, has widespread effects throughout the watershed, particularly in regard to agriculture (Calvin, 1946, pp. 93–106, Grenville Goodwin).

The communities of the Upper Gila River Watershed have witnessed threshold moments just in the past two hundred years where decision-making at particular points in time resulted in substantial shifts in the future development and land use of the Valley. These threshold moments demonstrate how a collective choice or series of choices can result in long-term effects for residents and the flora and fauna of the region. Land surveys and ownership arrangements established in the late 19th century impacted access to important resources like surface water and mineral rights. Site selections for new roadways and

and railways have had spillover effects for those communities included or excluded from such projects. In other cases, when expensive public projects were constrained by limited budgets, decisions were required to weigh community support. An early 20th century referendum led to the construction of a highway from Safford to Duncan instead of a dam in the area of the Gila Box. A long-term, anti-wildfire policy on federal forest lands has been shown to have counterproductive results, as the reduction in frequent, small-intensity fires is replaced by infrequent, but tremendously destructive high-intensity blazes like the Wallow Fire in 2011. Decisions and policies regarding land use and resource management can have lasting, long-term cumulative impacts on the watershed.

While technology and outside funding sources have increased options regarding access to and availability of water, this resource remains a scarce and therefore valuable resource. Recent droughts and lowered water tables have demonstrated the continuing vital importance of water for a broad variety of uses, from agriculture to mining to ecosystem services to residential/domestic daily activities. The ongoing drought conditions through the year 2013 have resulted in substantial acreage of farmland left fallow and new conservation actions by the City of Safford in response to water supply stresses (Johnson, 2013). From historic examples to the present, the sustainability of water supplies in the face of fluctuating precipitation levels has remained a constant theme in the life of residents of the Upper Gila River Watershed.

Chapter 2 References

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Photo opposite: David Chan